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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,718	10/14/2003	George Shih	81044317 (#202-0587)	4278

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EXAMINER	
CHAUDHRY, SAEED T	
ART UNIT	**PAPER NUMBER**
1746	

DATE MAILED: 12/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/684,718	SHIH ET AL.	
	Examiner	Art Unit	
	Saeed T. Chaudhry	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *17-25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/14/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restriction

Restriction to one of the following inventions is required under 35 U.S.C. 121:

Group I, Claims 1-16, drawn to a method of readying a fuel cell cooling circuit, classified in Class 134, subclass 22.1.

Group II, Claims 17-25, drawn to an apparatus comprising a flushing system including a cooling circuit, a filtering system and a pump for circulation, classified in Class 134, subclass 166 R.

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (M.P.E.P. § 806.05(e)). In this case the process as claimed can be practiced by another materially different apparatus such as without a filter or the apparatus as claimed can be used to practice another and materially different process such as mixing liquid.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, have acquired a separate status in the art because of their recognized divergent subject matter, the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Carlos Hanze on November 17, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-16. Affirmation of this election must be made by applicant in responding to this Office action. Claims 17-25 are withdrawn from further consideration by the Examiner, 37 C.F.R. § 1.142(b), as being drawn to a non-elected invention.

Joint Inventors

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 C.F.R. § 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a diligently-filed petition under 37 C.F.R. § 1.48(b) and by the fee required under 37 C.F.R. § 1.17(h).

Claim Rejections - 35 USC § 112

Claim 7 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 is incomplete and confusing because it is not clear how the filter is blocked and what is the location of the filter in the cooling circuit.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made

The factual inquiries set forth in Graham v. John Deere Co., 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

Claims 1-3, 5-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Kralick in view of Light.

Kralick (6,316,137) disclose a method of cooling a fuel cell stack by circulating coolant through the fuel cell stack through a cooling circuit (see col. 1, lines 47-51, col. 2, line 58 through col. 3, line 54 and claims). The reference fails to disclose a method of flushing and circulating coolant through a cooling circuit.

Light (5,094,757) disclose a method for removing contaminants from a cooling circuit by flushing the cooling circuit and filling the cooling circuit with a volume of coolant.

Two quick-connect hoses from the system are attached to the vehicle in a manner which provides maximum cross system flow, usually the radiator filler neck and an opposing hose. The coolant in being cleansed and rejuvenated flows through two cycles i.e. a flush cycle and a fill cycle. The contaminated coolant in the flush tank is re-circulated from the vehicle through a flush tank refinery and back to the vehicle. The flush cycle has a treating time of approximately 15 minutes but may be run for a longer period. In the fill cycle, the cleansed coolant is pump-circulated to the vehicle from the fill tank and back to the flush tank. During the fill cycle, the now cleansed circulating coolant is fed from the flush tank to the fill tank. At the time of flush cycle, the pressure of the system is monitored (see col. 2, lines 8-9).

With reference to FIG. 1 of the drawings, the system in general is indicated by 10. Two quick-connect hoses 11 and 23 are attached to any opposing hose and radiator filler neck respectively of the vehicle or an internal combustion engine cooling system to be flushed and filled. The system of the invention is turned on along with the engine of the cooling system to be flushed and filled. The contaminated coolant is pumped through hose 11 to a filter 13 where solids in the contaminated coolant are collected in a bag filter later to be removed. The contaminated coolant then passes through pipe 14 to the flush tank 16 where the contaminated

coolant passes from bottom to top through the electrostatic precipitator 17 and out the bottom of flush tank 16, through pipe 18, open valve 19, pump 21 and hose 23 to the vehicle. A constant level of coolant is maintained in the flush tank (see col. 1, lines 50-67, col. 2, lines 48-64). The reference fails to disclose a method of flushing a fuel cell cooling circuit.

It is well known in the art to use a cooling circuit for cooling a fuel cell by circulating a coolant through the heat exchanger of the fuel cell as disclosed by Kralick. It is also well known in the art of heat exchanger that circulating coolant through the heat exchanger produce scale and contamination in the cooling coils, which reduces the heat exchange capacity of the heat exchanger and the heat exchanger need cleaning. Light discloses such as method for cleaning heat exchanger of a vehicle, wherein the engine produces heat and coolant circulating through the heat exchanger reduce the heat in the engine. The same concept is used in the fuel cell, wherein fuel cell produce heat and heat is reduce by circulating through the coolant through the heat exchanger. Therefore, it would have been obvious at the time applicant invented the claimed process to incorporate the cited steps of flushing and filtering the contaminants from the coolant as disclosed by Light for flushing and filtering the fuel cell cooling circuit as disclosed by Kralick to enhance the efficiency of the heat exchanger of the fuel cell. Further, one of ordinary skill in the art would block the flow of liquid to the filter to prevent the filter to be contaminated. Furthermore, one of ordinary skill in the art would heat the coolant because high temperature of the cleaning liquid is known to be more effective for the removal of the contaminations.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kralick in view of Light as applied to claim 3 above, and further in view of Yamada.

Kralick and Light were discussed supra. However, the references fail to disclose a de-ionization filter.

Yamada (6,887,608) discloses fuel cell having a circulation circuit and utilize a deionization filter 62 to cause a decrease in an electric conductivity (see col. 9, lines 1-5).

It would have been obvious at the time applicant invented the claimed process to incorporate a deionization filter as disclosed by Yamada in the process of Light to reduce the electric conductivity of the coolant.

Claims 1-3, 5-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Oko et al in view of Light.

Oko et al (2001/0049033) disclose a method for removing contaminants from a fuel cell flow channels by flushing a volume of the liquid into the fuel entrance, where the liquid volume is greater than an amount of space within the stack available for liquid. The flushing liquid is deionized water (see [0058]). The reference fails to disclose a step of filling the cooling circuit with coolant and circulating the a volume of coolant external to the cooling circuit.

Light (5,094,757) disclose a method for removing contaminants from a cooling circuit by flushing the cooling circuit and filling the cooling circuit with a volume of coolant.

Two quick-connect hoses from the system are attached to the vehicle in a manner which provides maximum cross system flow, usually the radiator filler neck and an opposing hose. The coolant in being cleansed and rejuvenated flows through two cycles i.e. a flush cycle and a fill cycle. The contaminated coolant in the flush tank is re-circulated from the vehicle through a flush tank refinery and back to the vehicle. The flush cycle has a treating time of approximately 15 minutes but may be run for a longer period. In the fill cycle, the cleansed coolant is pump-circulated to the vehicle from the fill tank and back to the flush tank. During the fill cycle, the

now cleansed circulating coolant is fed from the flush tank to the fill tank. At the time of flush cycle, the pressure of the system is monitored (see col. 2, lines 8-9).

With reference to FIG. 1 of the drawings, the system in general is indicated by 10. Two quick-connect hoses 11 and 23 are attached to any opposing hose and radiator filler neck respectively of the vehicle or an internal combustion engine cooling system to be flushed and filled. The system of the invention is turned on along with the engine of the cooling system to be flushed and filled. The contaminated coolant is pumped through hose 11 to a filter 13 where solids in the contaminated coolant are collected in a bag filter later to be removed. The contaminated coolant then passes through pipe 14 to the flush tank 16 where the contaminated coolant passes from bottom to top through the electrostatic precipitator 17 and out the bottom of flush tank 16, through pipe 18, open valve 19, pump 21 and hose 23 to the vehicle. A constant level of coolant is maintained in the flush tank (see col. 1, lines 50-67, col. 2, lines 48-64). The reference fails to disclose a method of flushing a fuel cell cooling circuit.

It would have been obvious at the time applicant invented the claimed process to incorporate the cited steps of circulating a coolant from a external tank and filling the coolant after flushing the cooling circuit as disclosed by Light into the process of Oko et al for the purpose of efficient removal of the contamination because circulating the coolant through the channels would perform better cleaning. One of ordinary skill in the art would use heated coolant because high temperature of the coolant is known to increase dissolving effect. Further, one of ordinary skill in the art would block the filter during circulation to prevent the filter to be contaminated with contamination. Light discloses to monitor the pressure during the circulation. Therefore, one of ordinary skill in the art would monitor the pressure for efficient results.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oko et al in view of Light as applied to claim 3 above, and further in view of Yamada.

Oko et al and Light were discussed supra. However, the references fail to disclose a de-ionization filter.

Yamada (6,887,608) discloses fuel cell having a circulation circuit and utilize a deionization filter 62 to cause a decrease in an electric conductivity (see col. 9, lines 1-5).

It would have been obvious at the time applicant invented the claimed process to incorporate a deionization filter as disclosed by Yamada in the process of Light to reduce the electric conductivity of the coolant.

The Prior art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Grasso (4,855,192) discloses a method of discharging waste water produced by the operation of a fuel cell.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed T. Chaudhry whose telephone number is (571) 272-1298. The examiner can normally be reached on Monday-Friday from 9:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Michael Barr, can be reached on (571)-272-1414. The fax phone number for non-final is (703)-872-9306.

When filing a FAX in Gp 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1700.

Saeed T. Chaudhry
Patent Examiner

MICHAEL BARR
SUPERVISORY PATENT EXAMINER